

1 The opinion in support of the decision being entered today was *not* written
2 for publication and is *not* binding precedent of the Board.
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5 UNITED STATES PATENT AND TRADEMARK OFFICE

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8 BEFORE THE BOARD OF PATENT APPEALS
9 AND INTERFERENCES

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12 *Ex parte* HAMID RABIE,
13 HIDAYAT, HUSAIN and
14 HENRY BEHMANN

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17 Appeal 2007-0362
18 Application 09/425,234
19 Technology Center 1700

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22 Decided: March 23, 2007

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26 Before BRADLEY R. GARRIS, CHUNG K. PAK, and
27 JEFFREY T. SMITH, *Administrative Patent Judges*.

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29 SMITH, *Administrative Patent Judge*.

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31
32 DECISION ON APPEAL

33 This appeal involves claims 5-17, the only claims pending in this
34 application. We have jurisdiction under 35 U.S.C. § 134.

BRIEF STATEMENT OF THE INVENTION

2 Appellants' invention is directed to a method of chemical cleaning
3 one or more ultrafiltration or microfiltration membranes, normally immersed
4 in water containing solids, that become dirty or fouled during normal
5 operation. Representative independent claim 5, as presented in the Brief,
6 appears below:

7 5. A method of cleaning one or more membranes normally
8 immersed in water containing solids in a tank, the one or more
9 membranes arranged into one or more modules such that permeate
10 sides of the one or more membranes enclose a space in
11 communication with one or more headers of the one or more modules,
12 and used to produce a filtered permeate comprising:

14 performing cleaning events having the steps of:

16 (a) stopping permeation;

18 (b) after step (a), and before resuming permeation,
19 flowing a chemical cleaner to the one or more headers in a series of
20 pulses, wherein the pulses are separated from each other by waiting
21 periods in which the flow of chemical cleaner is stopped;

23 (c) after step (b), resuming permeation;
24 wherein

26 (d) the membranes remain immersed in the water
27 containing solids while the chemical cleaner flows to the one or more
28 headers:

29 (e) the outside of the membranes is in fluid
30 communication with the water containing solids; and

32 (f) during step (b), all chemical cleaner reaching the one
33 or more headers remains in the enclosed space of the one or more
34 modules or flows through the walls of the membranes in a direction
35 opposite to the direction in which permeate normally passes through
36 the walls of the membranes.

1 The Examiner relies on the following reference in rejecting the
2 appealed subject matter:

3 Smith US 5,403,479 Apr. 4, 1995

4 The Examiner entered the following final rejections:

5 I. Claims 6-10 are rejected under 35 U.S.C. § 112, second paragraph,
6 as indefinite for failing to particularly point out and distinctly claim the
7 subject matter which is regarded as the invention.

8 II. Claims 5-10 and 13-17 are rejected under 35 U.S.C. § 102 (b) as
9 anticipated by Smith.

10 III. Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) as
11 unpatentable over Smith.

12 IV. Claims 5-17 are rejected for obviousness type double patenting
13 over the copending claims 1-23 of application 11/106,681.

DISCUSSION

15 I. Claims 6-10 are rejected under 35 U.S.C. § 112, second paragraph, as
16 indefinite for failing to particular point out and distinctly claim the subject
17 matter which is regarded as the invention.

18 The Examiner contends that the limitation "more intensive first
19 cleanings" indefinite since it is not defined in the present specification
20 (Answer 4). Appellants contend the phrase "more intensive first cleanings"
21 was introduced by amendment on January 14, 2004. Appellants assert that
22 since the introduction of this claim language, there have been several office
23 actions and the Examiner understood the claim well enough to examine it
24 (Br. 6).

1 “The legal standard for definiteness [under the second paragraph of
2 35 U.S.C. § 112] is whether a claim reasonably apprises those of skill in the
3 art of its scope.” *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754,
4 1759 (Fed. Cir. 1994). The inquiry is to determine whether the claim sets
5 out and circumscribes a particular area with a reasonable degree of precision
6 and particularity. The definiteness of the language employed in a claim
7 must be analyzed not in a vacuum, but in light of the teachings of the
8 particular application. *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236,
9 238 (CCPA 1971). This is especially true in a situation involving a relative
10 claim expression since the specification must provide some standard for
11 defining or measuring its meaning. *Seattle Box Co. v. Industrial Crating &*
12 *Packing, Inc.*, 731 F.2d 818, 826, 221 USPQ 568, 574 (Fed.Cir. 1984).

13 After consideration of the present record, we determine that a person
14 of ordinary skill in the art would not have recognized the scope of the
15 disputed relative claim language. Appellants have not directed us to specific
16 portions of the Specification, from which a clear meaning of the phrase
17 could be gleaned. That is, we have not been directed to portions of the
18 Specification that provide guidance to determine the meaning of the claimed
19 “more intensive” cleaning. As such, the Examiner’s rejection on this basis is
20 affirmed.

21 II. Claims 5-10 and 13-17 are rejected under 35 U.S.C. § 102 (b) as
22 anticipated by Smith.

23 The Examiner contends that Smith describes a method for cleaning
24 one or more membranes normally immersed in water containing solids. The
25 Examiner contends the method comprises stopping the flow of the cleaning
26 chemicals by pulsing wherein a low pressure above atmospheric, but no

1 more than the bubble point of the membrane is cyclically used to clean the
2 headers/lumen (Answer 5 and 10). Appellants contend that the range of
3 pressures described in the Smith reference provides the minimum and
4 maximum range for the low pressure part of the cycle. Specifically
5 Appellants contend that the reference describes decreasing the pulse rate, but
6 does not imply stopping the flow between pulses (Br. 7).

7 The Examiner contends that Smith, (col. 11 ll. 29-47; and col. 17 ll.
8 50-56), describes the non-recirculating flow of chemical cleaner during the
9 pulse cleaning cycles. On the other hand, the Appellants contend that Smith
10 does not disclose dead-ending the cleaning chemical (Br. 7-8).

11 The issue before us is whether the Examiner has properly determined
12 that the Smith reference teaches or describes the claimed subject matter
13 under 35 U.S.C. § 102(b). Specifically, the first issue is whether the Smith
14 reference describes flowing a chemical cleaner to one or more headers in a
15 series of pulses, wherein the pulses are separated from each other by waiting
16 periods in which the flow of the chemical cleaner is stopped. The second
17 issue before us is whether the Smith reference describes the non-
18 recirculating (dead end) flow of chemical cleaner through the walls of the
19 membrane separated by pulses.

20 Smith describes a method of cleaning one or more membranes
21 normally immersed in water containing solids that comprises introducing
22 cleaning fluid into the permeate and recycling in through the lumens at a low
23 pressure from about atmospheric, but below the bubble point of the fiber.
24 Specifically Smith states:

25 Highly effective cleaning of a module containing an UF or a
26 MF membrane having a fouled surface is obtained during an
27 unexpectedly short period, without draining feed (substrate) from

1 the module, by introducing a chosen cleaning fluid into the
2 permeate and recycling it through the lumens at low pressure in
3 the range from about atmospheric but no more than the bubble-
4 point of the fiber. The method comprises maintaining a selected
5 low pressure no more than the bubble-point either continuously,
6 or cyclically applied, over a short period of time, preferably less
7 than 1 hr, sufficient to diffuse enough cleaning fluid through
8 pores in the membrane into the dirty water, substantially to re-
9 establish the initial stable flux. The low pressure may be
10 substantially constant, or it may be deliberately varied within a
11 period of less than 5 sec, preferably less than 1 sec. When pulsed
12 to achieve pulsed diffusion, the pressure exerted by the cleaning
13 fluid may vary from a minimum of about 100 kPa (1 bar, at least
14 0.1 psig, preferably 0.5 psig) for a "loose" MF (5 μ m) to a
15 maximum of 100 psig for a "tight" UF (50 \AA), within less than 1
16 sec, which pulsing affords diffusion-controlled permeation. [Col.
17 ll. 21-43.]

18
19 Smith also discloses (col. 16, 1. 68 to col. 17, 1. 2) that:

20 Since there is very little hydraulic pressure, typically less
21 than 1.33 bar (5 psig) exerted by the cleaning fluid in the pores
22 of the membrane while the fluid is recirculating through the
23 membrane, and insufficient pressure to cause hydraulic flow of
24 solution through the pores eve if pulsed, the flux obtained with
25 the solution, is essentially diffusion-controlled and foulant
26 lodged in the pores cannot be dislodged by hydraulic pressure.
27 Instead, foulants are dissolved by chemical action. The main
28 purpose of pulsing is to avoid, to the extend possible, diffusion
29 flow through pores....

30
31 We agree with Examiner that the above passages in the Smith
32 reference describe the pulse cycling of the cleaning fluid. The Examiner
33 also correctly asserts that all of the pressures taught by Smith are below the
34 bubble point and the peak pressures of the pulses are the bubble point.
35 Appellants also acknowledge that all the pressures of the Smith reference are
36 below the bubble point of the membranes (Reply Br. 2-3). It follows that

1 substantial evidence supports the Examiner' finding that there would have
2 been no flow through the membrane except at the peak pressures, i.e., the
3 pulsing of the cleaning fluid.

4 Appellants argue that the bubble point pressure only refers to the flow
5 of gas as a bubble breaking through a pore and that gas can flow by diffusion
6 through a pore at less than the bubble point pressure (Reply Br. 3).

7 Appellants' arguments are not persuasive. They are not supported by any
8 objective evidence. *In re De Blauwe*, 736 F.2d 699, 705,222 USPQ 191,
9 196 (Fed. Cir. 1984).

10 Regarding the second issue before us, the Examiner cites Smith (col.
11 11 ll. 29-47; and col. 17 ll. 50-56) for describing the non-recirculating flow
12 of chemical cleaner during the pulse cleaning cycles (Answer 1). Smith, for
13 example, discloses (col. 17, ll. 50-56) that:

14 Check valve 23 is left openwhen cleaning solution is
15 either circulated with pump 24 or pulsed when a pulse pump is
16 substituted for pump 24. In those instances where it is desired
17 to "dead end" the biocidal solution under only enough pressure
18 to permit its diffusion-controlled flow out of the fibers, both the
19 check valves 26 and 28 are closed.
20

21 Appellants' response appearing on page 3 of the Reply Brief does not
22 explain why the cited portions of the Smith reference does not describe dead
23 end flow as asserted by the Examiner. After review of the cited portions of
24 the Smith reference, we agree with the Examiner's position.

25 We procedurally reverse the rejection of claims 6 to 10 over the Smith
26 reference. Claims 6 to 10, have been rejected under 35 U.S.C. § 102(b) as
27 unpatentable over Smith. We have carefully considered the subject matter
28 defined by these claims, however, for reasons stated *supra* in our discussion

1 of the rejection under the second paragraph of 35 U.S.C. § 112, no
2 reasonably definite meaning can be ascribed to certain language appearing in
3 the claims. As the court in *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ
4 494, 496 (CCPA 1970) stated:

5 [a]ll words in a claim must be considered in judging the
6 patentability of that claim against the prior art. If no reasonably
7 definite meaning can be ascribed to certain terms in the claim,
8 the subject matter does not become obvious-the claim becomes
9 indefinite.

10
11 In comparing the claimed subject matter with the applied prior art, it
12 is apparent to us that considerable speculations and assumptions are
13 necessary in order to determine what in fact is being claimed. Since a
14 rejection based on prior art cannot be based on speculations and
15 assumptions, see *In re Steele*, 305 F.2d 859, 862, 134 USPQ 292, 295
16 (CCPA 1962), we are constrained to reverse, pro forma, the Examiner's prior
17 art rejections of claims 6 to 10. We hasten to add that this is a procedural
18 reversal rather than one based upon the merits of the prior art rejections, as
19 noted above.

20 III. Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) as
21 unpatentable over Smith.

22 Claims 11 and 12 define waiting periods between the claimed cycles
23 of pulses. Appellants have not disputed the Examiner's finding that such
24 periods are no more than result effective variables. Compare Answer 9 with
25 Br. 10-11. Nor have Appellants proffered any evidence of unexpected
26 results for the claimed subject matter . Thus, we agree with the Examiner's
27 determination that the subject matter of claims 11 and 12 would have been
28 obvious. .

1 IV. Claims 5-17 are rejected for obviousness-type double patenting
2 over the copending claims 1-23 of application 11/106,681.

3 Appellants do not dispute that the appealed claims are patentably
4 indistinct from the claims of the copending application 11/106,681. Rather,
5 Appellants contend that the double patenting rejections are provisional and
6 should be withdrawn in the present application and converted into the non-
7 provisional rejections in the 11/106,681 application (Br. 5). Appellants
8 citation to *the Manual of Patenting Examining Procedure (MPEP)* § 804,
9 part IB, does not provide a basis for withdrawing the rejections in the
10 present application, because these are not the sole rejections remaining in the
11 present case. Appellants have not substantively challenged the merits of the
12 stated rejections. We therefore uphold with the Examiner's rejections.

13 **CONCLUSION OF LAW**

14 The Examiner did not err in rejecting claims 6-10 under 35 U.S.C.
15 § 112, second paragraph.

16 The Examiner did not err in rejecting claims 5 and 13-17 under
17 35 U.S.C. § 102(b) as anticipated by Smith.

18 The Examiner did not err in rejecting claims 11-12 under 35 U.S.C.
19 § 103 as obvious over Smith.

20 The Examiner did not err in provisionally rejecting claims 5-17 for
21 obviousness type double patenting over the copending claims 1-23 of
22 application 11/106,681.

23 The Examiner erred in rejecting claims 6-10 under 35 U.S.C.
24 § 102(b) as anticipated by Smith.

ORDER

The rejection of claims 6-10 under 35 U.S.C. § 112, second paragraph, is affirmed.

The rejection of claims 5 and 13-17 under 35 U.S.C. § 102(b) as anticipated by Smith is affirmed.

The rejection of claims 11-12 under 35 U.S.C. § 103(a) as obvious over Smith is affirmed.

The provisional rejection of claims 5-17 for obviousness type double patenting over the copending claims 1-23 of application 11/106,681, is affirmed.

11 The rejection of claims 6-10 under 35 U.S.C. § 102(b) as anticipated by
12 Smith is reversed.

13 No time period for taking any subsequent action in connection with
14 this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

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